- **Ideal for alarm circuits, bike horns, ball game noise makers.**
- **15 watt peak audio power.**
- **Easy to build circuit also teaches about CMOS oscillators.**
- **Drives any speaker.**
- **Includes instruction to configure as a single tone oscillator.**
- **Runs on 9 - 12 VDC.**

Mad Blaster
—*15 Watt*—
Audio Alarm

Generates a LOUD warbling noise. A great attention getter. Complete instructions guide you through assembly so you get a working unit every time.

ramsey

Kit No. MB1

INTRODUCTION

The Ramsey MB1 Mad Blaster lets you put a 4011 IC and two transistors to work in an amazing variety of noisy applications! In this short booklet, we'll show you how to build it, change it around, and put it to work for you. The MB1 produces a LOUD attention-getting sound. Assembly is not complex, since a maximum of 9 PC-board parts are involved. However, the tiny MB1 PC board needs the same TLC required by the most complex Ramsey Kits.

PARTS LIST

- ☐ 2 .01 uF disc capacitor [marked .01 or 103 or 10nF] (C1 C2)
- ☐ 1 4.7 megohm resistor [yellow-purple-green] (R1)
- ☐ 1 1 megohm resistor [brown-black-green] (R2)
- ☐ 2 100K ohm resistors [brown-black-yellow] (R3,R4)
- ☐ 1 Small NPN transistor [type 2N3904 or equivalent] (Q1)
- ☐ 1 NPN power transistor [may vary in style] (Q2)
- ☐ 1 4011 IC [integrated circuit] 14-pin DIP (U1)
- ☐ 1 MB1 PC board

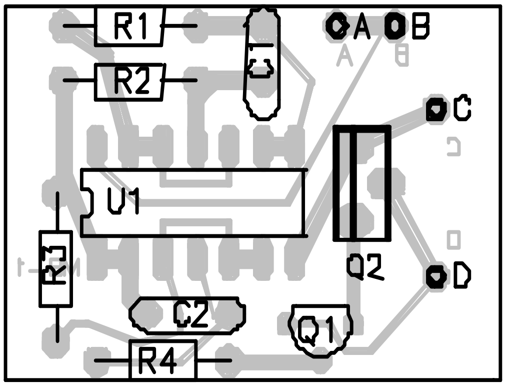
REQUIRED, NOT SUPPLIED:

- ☐ Battery or other DC power supply
- ☐ Speaker
- ☐ Hookup wire for DC power and speaker

HELPFUL, NOT SUPPLIED:

- ☐ Volume control potentiometer or trimmer [100k or more]
- ☐ DC voltage on-off switch
- ☐ Misc. hardware: jacks, case, or PC-board mounting bracket
- ☐ Alternate values for C1, C2, R3 [for varying sound effects]
- ☐ Some kind of heatsink for Q2

LAYOUT DIAGRAM



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ASSEMBLY PROCEDURE

The order for installing parts is not critical, but some planning ahead will put your MB1 to work for your special application more easily.

1. In the following steps, the word "INSTALL" means: Insert the part correctly in its PC-board holes. Bend the leads as needed to hold the part in place. Solder all connections. Trim or "nip" all excess wire lengths.

☐ 2. Notice that R1 and R2 are installed side by side in one corner of the PC board. Installing these two parts first will minimize confusion about which end of this small PC board is up or down!

☐ 3. Install R1, 4.7 megohms [yellow-violet-green].

☐ 4. Install R2, 1 megohm [brown-black-green].

☐ 5. Install U1 the 4011 IC. Be very sure that the end with the notch or dot is toward the same end of the board as R1 and R2. Solder with good lighting and patience to avoid solder bridges.

☐ 6. Install Q1, the smaller transistor. ***NOTE:*** The silkscreen representing the position of Q1 on the PC board is incorrect. The **correct position** of Q1 is the flat side facing the 4011 IC.

☐ 7. Install R4, the 100K resistor near Q1, HINT: if you think you will want to add a volume control, do not cut the R4 lead going to the base (center lead) of Q1 after soldering. This creates a convenient volume control solder connection.

☐ 8. Install R3, the other 100K resistor, near the notched end of the 4011 IC.

☐ 9. Install C2, .01 uf disc [marked .01 or 103 or 10nF].

☐ 10. Install C1, .01 uf disc [marked .01 or 103 or 10nF].

☐ 11. Install Q2 with the lettering towards U1 and the metallic side towards the edge of the circuit board.

SET-UP AND TESTING

☐ 1. Solder a length of red hookup wire to point A.

☐ 2. Solder a length of black hookup wire to point C.

☐ 3. Use a speaker wire or two lengths of hookup wire to connect an 8-ohm speaker to points B and D. Remember that the speaker should be able to handle up to 15 watts. Most medium size utility speakers [4" and larger] will work fine.

☐ 4. Connect the black wire to the [-] side of a 12-volt DC source, the ideal supply voltage for the MB1. Touch the red wire briefly to the [+] side of the 12 volt source, and you should immediately get a loud "mad blast".

TROUBLESHOOTING

When you are completely satisfied with your solder connections, and the MB1 does not work, you can perform a few simple tests to locate the problem. If the 4011 sound generator is working, you can hear it through a separate test amplifier connected to the base of Q1. The sound should be stronger at the base of Q2. If so, your problem is Q2. If not, replace Q1 before suspecting Q2.

MB1 THEORY OF OPERATION

The 4011 IC contains four two-input NAND gates. Two pairs of gates are wired as special-effects generators, one pair for very low audio frequencies and the other pair for mid-range tones. The pulsing or "interruption rates" can be changed by different values for R1 and R3. The combined sounds of the two generators are amplified by Q1 and further boosted by Q2. The collectors of Q1 and Q2 receive DC operating voltage through the speaker. The MB1 produces a high average power by reducing the ratio between peak power and average power.

FINAL HOOKUPS AND PRACTICAL USES

The power output of Q2 generates considerable heat if operation is prolonged. Unless your application only calls for very brief bursts of sound, some sort of heatsinking for Q2 may be needed. The transistor's mounting hole makes it easy to attach a small piece of aluminum or copper. Be aware that the exposed gold part of the transistor is common to the collector, so you don't want to neatly attach your heatsink to the ground side of the circuit!

If you would like to use the MB1 kit as a single tone generator, i.e. a morse code practice oscillator, removing C1 will cause only one tone to be heard .

If you desire a volume control, install your own 100K trimmer or other potentiometer from ground to the point mentioned in Assembly Step No. 8, as indicated on the schematic.

If you are using the MB1 for an automobile or other situation with 12 volts DC easily available, the DC supply will be easy. For other applications, the least expensive voltage source will be ordinary C and D batteries bought at a good sale price. Since the MB1 becomes very painful to run for more than a few seconds, bargain batteries should last a while! For easiest hookup, use two 4 cell C and D battery holders [Radio Shack 270-389 or 390], with all batteries in series

Finally, enterprising experimenters should be aware that the noise characteristics of the 4011's multiple tones are controlled by resistor and capacitor values [C1,C2,R3]. Feel free to experiment as long as you understand the terms of the Ramsey Mini-Kit Warranty.

CONCLUSIONS:

On the FUN side, Ramsey Electronics just cannot be responsible for any derogatory remarks, broken romances or black eyes you may experience as a result of using this kit. On a more serious note, please use common sense and realize that unexpected and frightening sounds can be a real hazard to the health of some elderly, otherwise infirm, or sleeping people.

So----have a Mad, Mad Blast with your Ramsey Mad Blaster!!!!!!

If you've enjoyed this kit be sure to check out the entire Ramsey kit line. We have a whole series of hobby and electronic kits that not only teach state-of-the-art technology, but are fun and easy to build, too! Call or write for our free catalog.

The Ramsey Kit Warranty

The Ramsey Kit Warranty Please read carefully BEFORE assembling your kit. All Ramsey kits will work if assembled properly. The very fact that your kit includes this new manual is your assurance that a team of knowledgeable people have field-tested several "copies" of this kit straight from the Ramsey inventory. If you need help, please read through your manual carefully, all information required to properly build and test your kit is contained within the pages!

1. DEFECTIVE PARTS: It's always easy to blame a part for a problem in your kit, Before you conclude that a part may be bad, thoroughly check your work. All our kit parts carry the Ramsey Electronics Warranty that they are free from defects for a full ninety (90) days from the date of purchase. Defective parts will be replaced promptly at our expense. If you suspect any part to be defective, please mail it to our factory for testing and replacement. Please send only the defective part(s), not the entire kit. Don't be afraid of telling us that you 'blew-it', we're all human and in most cases, replacement parts are very reasonably priced.

2. MISSING PARTS: Before assuming a part value is incorrect, check the parts listing carefully to see if it is a critical value such as a specific coil or IC, or whether a RANGE of values is suitable (such as "100 to 500 uf"). Often times, common sense will solve a mysterious missing part problem. If you're missing five 10K ohm resistors and received five extra 1K resistors, you can pretty much be assured that the '1K ohm' resistors are actually the 'missing' 10 K parts. If you believe we packed an incorrect part or omitted a part, please write or call us with information on the part you need and proof of kit purchase.

3. FACTORY REPAIR OF ASSEMBLED KITS: To qualify for Ramsey Electronics factory repair, kits MUST: 1. NOT be assembled with acid core solder or flux. 2. NOT be modified in any manner. 3. BE returned in fully-assembled form, not partially assembled. 4. BE accompanied by the proper repair fee. No repair will be undertaken until we have received the MINIMUM (1/2 hour) repair fee of $18.00, or authorization to charge it to your credit card account. 5. INCLUDE a description of the problem and legible return address. DO NOT send a separate letter; include all correspondence with the unit. Please do not include your own hardware such as non-Ramsey cabinets, knobs, cables, external battery packs and the like. Ramsey Electronics, Inc., reserves the right to refuse repair on ANY item in which we find excessive problems or damage due to construction methods. To assist customers in such situations, Ramsey Electronics, Inc., reserves the right to solve their needs on a case-by-case basis. The repair is $36.00 per hour, regardless of the cost of the kit. Please understand that our technicians are not volunteers and that set-up, testing, diagnosis, repair and repacking and paperwork can take nearly an hour of paid employee time on even a simple kit. Of course, if we find that a part was defective in manufacture, there will be no charge to repair your kit (But please realize that our technicians know the difference between a defective part and parts burned out or damaged through improper use or assembly).

4. REFUNDS: You are given ten (10) days to examine our products. If you are not satisfied, you may return your unassembled kit with all the parts and instructions and proof of purchase to the factory for a full refund. The return package should be packed securely. Insurance is recommended. Please do not cause needless delays, read all information carefully.

ramsey

PARTIAL LIST OF AVAILABLE KITS

RAMSEY TRANSMITTER KITS
- **FM10A, FM25B Stereo Transmitters**
- **AM1, AM25 AM Transmitters**
- **TV6 Television Transmitter**
- **FM100B Professional FM Stereo Transmitter**

RAMSEY RECEIVER KITS
- **FR1 FM Broadcast Receiver**
- **AR1 Aircraft Band Receiver**
- **SR2 Shortwave Receiver**
- **SC1 Shortwave Converter**

RAMSEY HOBBY KITS
- **SG7 Personal Speed Radar**
- **SS70A Speech Scrambler**
- **MD3 Microwave Motion Detector**
- **TFM3 Tri-Field Meter**
- **STC1 Stereo Transmitter Companion**

RAMSEY AMATEUR RADIO KITS
- **DDF1 Doppler Direction Finder**
- **CPO3 Code Practice Oscillator**
- **QRP Power Amplifiers**

RAMSEY MINI-KITS

Many other kits are available for hobby, school, scouts and just plain FUN. New kits are always under development. Write or call for our free Ramsey catalog.

Call or write for our full line catalog!

TOTAL SOLDER POINTS

36

ESTIMATED ASSEMBLY TIME

Beginner ....1.1 hrs
Intermediate ....0.6 hrs
Advanced ....0.5 hrs

REQUIRED TOOLS

- Soldering Iron Ramsey WLC100
- Thin Rosin Core Solder Ramsey RTS12
- Needle Nose Pliers Ramsey MPP4 or RTS05
- Small Diagonal Cutters Ramsey RTS04

<OR> Technician's Tool Kit TK405

ADDITIONAL SUGGESTED ITEMS

- Holder for PC Board/Parts Ramsey HH3
- Desoldering Braid Ramsey RTS08
- Digital Multimeter Ramsey M133

THE BEST KIT BUILDERS IN THE WORLD

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